

Oregon Rangeland Line-point Intercept Monitoring Protocol

Objective:

To quantitatively (accurately and precisely) monitor how vegetation changes over time. While quantitative information takes longer to collect it is useful for detecting smaller changes in vegetation cover and composition over time. Line-point intercept is a rapid, accurate method for quantifying soil cover, including vegetation, litter, rocks, and biotic crusts. These measurements are related to wind and water erosion, water infiltration and the ability of the site to resist and recover from degradation. Line-point intercept is frequently confused with Line Intercept (also known as Gap Intercept). While Line-point Intercept primarily measures foliar, basal, and soil cover; Line Intercept provides information about the proportion of the line covered by large gaps between plants.

Step-point or Pace transects are considered a qualitative (traits or attributes) measurement with semi-quantitative information that is similar to Line-point Intercept. However an easier way to collect qualitative data is taking a picture and recording general observations of the site.

Goals:

- 1) To document before and after conditions on representative sites that will be treated.
- 2) To document effectiveness of treatment in reducing threats to benefit sage-grouse over time
- 3) To quantitatively monitor changes in rangeland health over time.

Instructions for Establishing Permanent Transect and to measure Line-Point Intercept:

- 1) Choose a representative location within the treatment unit. Select an appropriate direction for your transect to lay. This is usually the same location as a photo point. Keep transect on one ecological site.
- 2) Permanently mark the location (origin) by driving a stake, rebar, or fencepost into the ground. Record the coordinates of the origin on the Field Sheet and save a waypoint at the location. Record the azimuth of the direction in which the transect will be pulled (compass adjusted to true north).
- 3) The line should be taut, as close to the ground as possible, and begin at the "0" end of the line. Preferred intervals are every 3 feet along a 150 foot tape which will add up to 50 data points. This interval is flexible depending on how long your tape is, however 50 data points are required to make an accurate data set. Always stand on the same side of the line and lean over the line to read the pin drop on the other side of the tape (the side you're not standing on). This is so as you walk up and down the transect and you are not influencing the vegetation measurements by stepping on structure.
- 4) Using a controlled drop with a pin flag, keep it vertical and record every plant species it intercepts from the top down to the soil surface. If no leaf or stem is intercepted record 'none' (Think of this like a rain drop falling)
- 5) Record each plant species only once. If you are uncertain of plant species record functional group or description.
 - AF#** = Annual forb (also includes biennials)
 - PF#** = Perennial forb
 - AG#** = Annual grass/sedge/rush (graminoid)
 - PG#** = Perennial grass/sedge/rush (graminoid)
 - SH#** = Shrub
 - TR#** = Tree
- 6) Foliage can be alive or dead but only record each species once. Note: Distinguishing dead vs live plants or plant parts is important for many objectives. Points where only dead plants or plant parts are intercepted can be recorded by either circling the species on the paper data form or otherwise noting it. Remember that many desert plants only appear to be dead.
- 7) After recording the canopy hits, then record the basal or soil surface hit. If a plant base hit, record the species, if a soil surface hit record:

- S** = Soil that is visibly unprotected
- L** = Litter
- R** = Rock (> 5 mm or ~1/4 inch in diameter)
- BR** = Bedrock
- EL** = Embedded litter
- M** = Moss
- LC** = Visible biotic crust on soil

Supplies:
Transect Tape
2 steel pins
1 pointer, such a pin flag
Data sheet & clipboard

Note: There are many available references for line-point intercept. This intent is to summarize the protocol into a 1 page guide.

Table 2. Sample data form for examples illustrated below. Points 1 and 2 show the first two points on a line. In Point 1, the pin flag is touching dead fescue, live bluegrass, clover, live fescue, litter and a rock. Record fescue only once, even though it intercepts the pin twice. In Point 2, the flag touches fescue, then touches litter and finally the fescue plant base. Table 2 shows how to record these two points on the data form.

Pt.	Top layer	Lower layers			Soil surface
		Code 1	Code 2	Code 3	
1	Fescue	Bluegrass	Clover	L	R
2	Fescue	L			Fescue
3	Fescue	L			S
etc.					

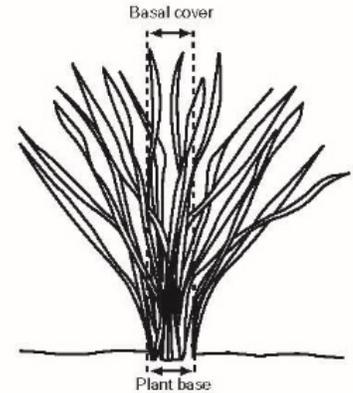
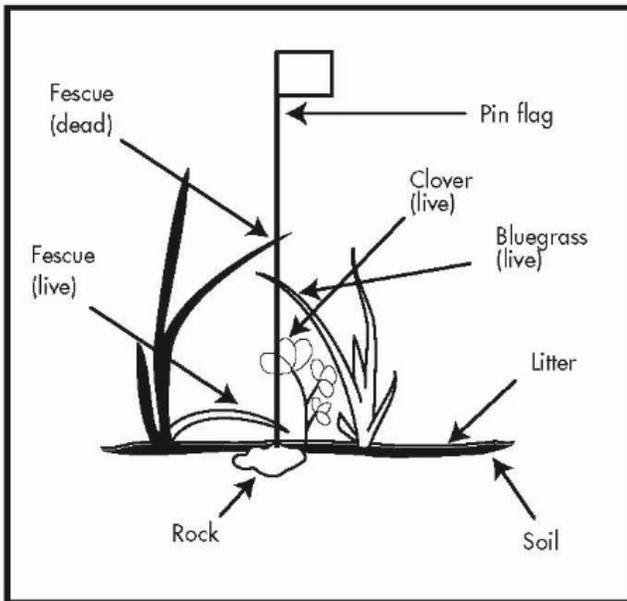
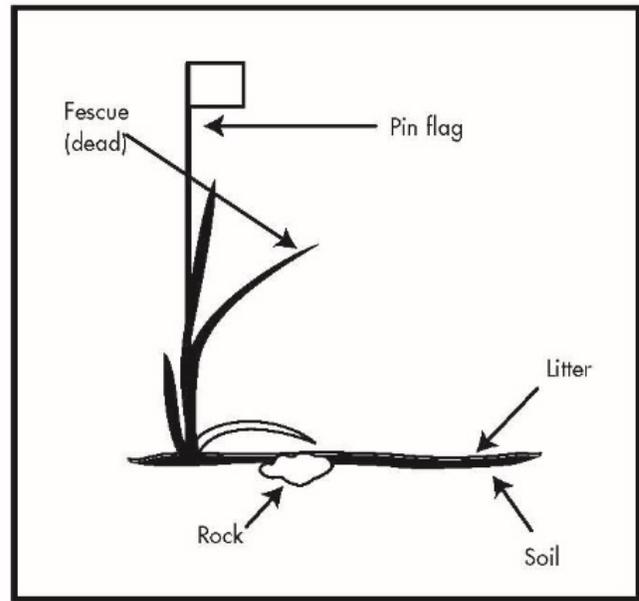


Figure 8. Area defined as plant base and included as basal cover.



Point 1



Point 2

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Line-point Intercept Data Form

Page _____ of _____

Shaded cells for calculations

Plot: _____ Line #: _____ Observer: _____ Recorder: _____

Direction: _____ Date: _____ Intercept (Point) Spacing Interval = _____ cm (_____ in)

Pt.	Top layer	Lower layers			Soil surface	Pt.	Top layer	Lower layers			Soil surface
		Code 1	Code 2	Code 3				Code 1	Code 2	Code 3	
1						26					
2						27					
3						28					
4						29					
5						30					
6						31					
7						32					
8						33					
9						34					
10						35					
11						36					
12						37					
13						38					
14						39					
15						40					
16						41					
17						42					
18						43					
19						44					
20						45					
21						46					
22						47					
23						48					
24						49					
25						50					

% foliar cover = _____ top layer pts (1st col) x 2 = _____ %
 % bare ground* = _____ pts (w/NONE over S) x 2 = _____ %
 % basal cover = _____ plant base pts (last col) x 2 = _____ %

Top layer codes: Species code, common name, or NONE (no cover).

Lower layers codes: Species code, common name, L
 (If present) % sagebrush cover = _____ canopy layer pts x 2 = _____ %
 (If present) Phase of Juniper _____

Unknown Species Codes:
 AF# = annual forb
 PF# = perennial forb
 AG# = annual graminoid
 PG# = perennial graminoid
 SH# = shrub
 TR# = tree

Soil Surface (do not use litter):
 Species Code (for basal intercept)
 R = rock fragment (>5 mm (~1/4 in) diameter)
 BR = bedrock, M = moss
 LC = visible biotic crust on soil
 S = soil without any other soil surface code
 EL = embedded litter (see page 10)
 D = duff

Location (description/UTM)
 Lower layers are empty (no L), and Soil surface = S.